REMARKS

The present Preliminary Amendment is submitted to amend the original claims in order to incorporate the amendments filed in the International Application under Article 34 on August 23, 2001. The Preliminary Amendment also deletes the references numerals in the claims and abstract, removes the multiple dependencies in the original claims, and adds new claims 31-38, thereby placing such claims in condition for examination and reducing the required PTO filing fee.

Copies of the amended portion of the claims and abstract with changes marked therein is attached and entitled "*Version with Markings to Show Changes Made.*"

Respectfully submitted,

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ABSTRACT

Handling of each arrayed component is implemented in pickup operation within a movement range of a supporting body against the size of a supporting region of the arrayed component smaller than that in the prior art. Each component supported on a supporting body in array is moved to a pickup position with a movement of the supporting body in X and Y two component array directions, and is fed to pickup operation by a tool with push-up operation by a push-up pin involved, in which after each unit region (D1 to D4) dividedly set around the pickup position of the supporting body is positioned at a pickup standby position by rotation of the supporting body in a switching manner, the component in the positioned unit region is moved in each component array direction of the supporting body and fed to pickup operation in sequence.

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ABSTRACT

Handling of each arrayed component is implemented in pickup operation within a movement range of a supporting body against the size of a supporting region of the arrayed component smaller than that in the prior art. Each component (2) supported on a supporting body (6) in array is moved to a pickup position (C) with a movement of the supporting body (6) in X and Y two component array directions, and is fed to pickup operation by a tool (3) with push-up operation by a push-up pin (8) involved, in which after each unit region (D1 to D4) dividedly set around the pickup position of the supporting body (6) is positioned at a pickup standby position (E) by rotation of the supporting body (6) in a switching manner, the component (2) in the positioned unit region is moved in each component array direction of the supporting body (6) and fed to pickup operation in sequence.

CLAIMS

1. (amended) A method for handling arrayed components that feeds the arrayed components arrayed in two component array directions, comprising: moving each component [(2)] supported on a supporting body [(6)] in a state of being arrayed in two orthogonal directions [(X, Y)] to a pickup position [(C)] in sequence with a movement of the supporting body in the two component array directions, and making the components subjected to pickup operation by a component handling tool [(3)], wherein each unit region [(D1, D2)] set by dividing a component supporting region [(D)] of the supporting body about an approximately central position of the supporting body into a plurality of regions is positioned at a pickup standby position [(E)] by rotation of the supporting body about the approximately central position of the supporting body in a switching manner; and

after each unit region is positioned at the pickup standby position, positioning each component in the positioned unit region to the pickup position in sequence with a movement of the supporting body in the two component array directions, and subjected to pickup operation in sequence.

2. (amended) A method for handling arrayed components that feeds the arrayed components arrayed in two component array directions as defined in Claim 1, wherein the component is

subjected to the pickup operation by the component handling tool with push-up operation by a push-up pin [(8)] involved, and after each unit region is positioned at the pickup standby position, the component in the positioned unit region is moved to the pickup position in sequence with a relative movement of the supporting body, the pickup position, and the push-up pin in the two component array directions, and subjected to the pickup operation in sequence to feed the arrayed components arrayed in the two component array directions.

3. (amended) A method for handling arrayed components that feeds the arrayed components arrayed in two component array directions as defined in Claim 1, wherein the component is subjected to the pickup operation by the component handling tool with push-up operation by a push-up pin [(8)] involved, and when the component is subjected to the pick-up operation,

further comprising corresponding each unit region set by dividing a component supporting region of the supporting body about an approximately central position of the supporting body into a plurality of regions to the pickup position and the push-up pin, and

after the pickup position and the push-up pin are corresponded to each unit region, moving components in the unit region corresponding to the pickup position and the

push-up pin in sequence to the pickup position with a relative movement of the pickup position and the push-up pin, and the supporting body in the two component array directions, and making the components subjected to pickup operation in sequence to feed the arrayed components arrayed in the two component array directions.

4. (amended) A method for handling arrayed components as defined in [~~any one of~~] Claims 1 [to 3] wherein the unit region is a quarter region divided by an angle of 90 degrees.

5. (amended) An apparatus for handling arrayed components, comprising:

a component receiving section [(7)] for receiving and holding a supporting body [(6)] which supports components [(2)] arrayed in two orthogonal directions [(X, Y)];

a receiving section rotating device [(9)] for rotating the component receiving section about an approximately central position of the received supporting body, and for positioning each unit region [(D1, D2)] of a plurality of regions set by dividing a component supporting region [(D)] of the supporting body about the approximately central position of the supporting body into the regions at a pickup standby position [(E)] about the approximately central position of the supporting body in a switching manner; and

a two-direction moving device [(10)] that moves the component receiving section in the two component array directions and moves the components in a unit region positioned at the pickup standby position on the supporting body to the pickup position in sequence for making the components subjected to pickup operation by a component handling tool [(3)].

6. (amended) An apparatus for handling arrayed components as defined in Claim 5, further comprising a component transfer device [(31)] for picking up the component moved to the pickup position with use of the component handling tool and transferring the same to other places.

7. (amended) An apparatus for handling arrayed components as defined in Claim 5 [or 6], further comprising:

a component housing section [(32)] which makes it possible to handle the component in a packing style as being received in a component housing member for next-step handling [(42)]; and

a component transfer device [(31)] for picking up the component positioned at the pickup position with use of the component handling tool and transferring the same to the component housing member in the component housing section.

8. (amended) An apparatus for handling arrayed components as defined in [~~any one of~~] Claims 5 [to 7], further comprising:

an identifying device [(36)] for imaging the component at the pickup position and performing image recognition;

a reference position switching device [(37)] for switching reference of position recognition by the identifying device after a unit region at the pickup standby position is switched with rotation of the supporting body by the receiving section rotating device.

9. (amended) An apparatus for handling arrayed components as defined in Claim 7 [or 8], comprising:

a tool rotating device [(41)] for rotating the component handling tool about a center of the component to be picked up thereby; and

a control unit [(48)] for controlling the tool rotating device so as to correct a direction of the component picked up by the component handling tool through rotation of the component handling tool by the tool rotating device after a unit region located at the pickup standby position is switched with rotation of the supporting body by the receiving section rotating device.

10. (amended) An apparatus for housing arrayed components as defined in Claim 8, comprising a control unit [(48)] for controlling operation of the component housing section and the component handling tool so that the component housing section can provide a plurality of component housing

members side by side, and a plurality of the component housing members are separately used properly depending on a type of the component picked up by the component handling tool and identified by the identifying device for transfer and housing operation.

11. An apparatus for handling arrayed components as defined in Claim 10, wherein the type of the component is quality rank defined by electric characteristics and frequency characteristics of each component.

12. (amended) An apparatus for handling arrayed components as defined in Claim 11, wherein one of the types of the components is a defective product, and the control unit controls operation of the component handling tool so that the component handling tool disposes a component identified by the identifying device as a defective product in a disposal section [(48)].

13. (amended) An apparatus for handling arrayed components as defined in [any one of] Claims 7 [~~to 12~~], wherein the component housing member is a tape member [(48)].

14. (amended) An apparatus for handling arrayed components as defined in [~~any one of~~] Claims 5 [~~to 13~~], wherein the unit region is a quarter region divided at an angle of 90 degrees.

15. (amended) An apparatus for handling arrayed components as defined in [any one of] Claims 5 [~~to 13~~], wherein the unit

region is a half region divided at an angle of 180 degree.

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~~16. A method for handling arrayed components that~~ transfers the arrayed components arrayed in two component array directions, comprising:

feeding a supporting body (6) that supports a plurality of components (2) in a state of being arrayed in the two orthogonal directions (X, Y) to a component feeding position;

moving each component in sequence to a pickup position (C) with a movement of the supporting body at the component feeding position in the two component array directions;

picking up the component moved to the pickup position with use of the component handling tool (3); and

transferring the picked-up component to a component transfer target position (F) set to be laid over a top of the supporting body with use of the component ~~handling tool.~~

(amended)

17. A method for handling arrayed components as defined in Claim 1 that transfers the arrayed components arrayed in the two component array direction, comprising:

picking up the component moved to the pickup position with use of the component handling tool; and

transferring the picked-up component to a component transfer target position [(F)] set to be laid over

a top of the supporting body with use of the component handling tool.

18. (Amended) A method for handling arrayed components as defined in Claim 1 ~~or 17~~, wherein the component picked up with use of the component handling tool is transferred with front side and back side of the component inverted.

Cancel ~~19. An apparatus for handling arrayed components,~~ comprising:

a component receiving section (7) for receiving and holding a supporting body (6) that supports a plurality of components (2) in a state of being arrayed in two orthogonal directions (X, Y);

a two-direction moving device (10) that moves the component receiving section in the two component array directions for moving the components to the pickup position (C) in sequence;

a component housing section (70) disposed at a position to be laid over a top of the component receiving section; and

a component transfer device (131) for picking up the component and transferring the same to the component housing section whenever the component is moved to the ~~pickup position.~~

Cancel ~~20. An apparatus for handling arrayed components as defined in Claim 19.~~

~~wherein the component housing section is disposed~~ in a plurality of rows at a position to be laid over the top of the component receiving section, and

the component transfer device picks up the component and transfers the same to each component housing section whenever the component is moved to the pickup ~~position.~~

(amended)

21. An apparatus for handling arrayed components as defined in Claim 6, further comprising a component housing section [~~170~~] disposed at a position to be laid over a top of the component receiving section,

wherein the component transfer device [~~131~~] picks up the component and transfers the same to the component housing section whenever the component is moved to the pickup position.

22. An apparatus for handling arrayed components as defined in Claim 21,

wherein the component housing section is disposed in a plurality of rows at a position to be laid over the top of the component receiving section, and

the component transfer device picks up the component and transfers the same to each component housing section whenever the component is moved to the pickup position.

(amended)

23. An apparatus for handling arrayed components as

defined in ~~any one of Claims 19 to 22~~ Claim 21, further comprising a front-back inverting device ~~(171)~~ disposed between the transfer device and the component housing section, for selectively performing operation of receiving the component from the transfer device, inverting front side and back side of the component, and housing the component in the component housing section.

24. (amended) An apparatus for handling arrayed components as defined in Claim ~~20 or~~ 22, further comprising a second component transfer device ~~(90)~~ for receiving the component from the transfer device and separately transferring the component to the component housing section provided in a plurality of rows.

25. (amended) An apparatus for handling arrayed components as defined in Claim ~~20 or~~ 22, further comprising a front-back inverting device (171) for receiving the component from the component transfer device, moving to the component housing section provided in a plurality of rows, and separately transferring the component with front side and back side thereof inverted to each component housing section.

26. (amended) An apparatus for handling arrayed components as defined in Claim ~~20 or~~ 22, wherein a concave section ~~(42a)~~ of each component housing section disposed in a plurality of the rows is moved to a transfer target position ~~(P)~~ on the component receiving section, and the component is

transferred to the concave section of the component housing section moved to the transfer target position by the component transfer device.

27. (amended) An apparatus for handling arrayed components as defined in Claim ~~20 or 21~~ 22, wherein based on data identifying respective division of each component arrayed on the supporting body, each component of respective division is transferred to a plurality of the component housing sections disposed by division of each component.

28. (amended) An apparatus for handling arrayed components as defined in Claim 6, the components being a plurality of semiconductor elements ~~(12)~~ separated from a semiconductor wafer ~~(11)~~ by dicing, further comprising:

a component feeding section ~~(50)~~ for housing a supporting body ~~(16)~~ that supports the component in a state of being arrayed in the two orthogonal directions ~~(X, Y)~~ and feeding the same to a feeding position;

a taping packaging section ~~(70)~~ for housing the semiconductor elements in array in an extending direction of the tape member ~~(42)~~ and performing taping packaging; and

a front-back inverting device ~~(171)~~ disposed between the component transfer device and the taping packaging section, for selectively performing operation of receiving the semiconductor element from the component

transfer device, inverting front side and back side of the semiconductor element, and housing the component in the taping packaging section,

wherein the component receiving section [17] receives and holds the supporting body extracted from the component feeding section,

the two-direction moving device [10] moves the component receiving section in the two component array directions for moving the semiconductor element in sequence to a pickup position, and

the component transfer device [7] picks up the semiconductor element and transfers the same in sequence to the taping packaging section whenever the semiconductor element is moved to the pickup position.

29. An apparatus for handling arrayed components as defined in Claim 28, wherein the taping packaging section is disposed at a position to be laid over a top of the component receiving section.

(amended)

30. An apparatus for handling arrayed components as defined in Claim 28 [or 29], wherein based on data identifying each semiconductor element disposed in array on the semiconductor wafer by quality rank defined by electric characteristics and frequency characteristics of each semiconductor element, each semiconductor element of respective quality rank is transferred to a plurality of

taping packaging sections disposed by quality rank.